Technical Data Sheet

ABC-EL-TPU-101 - Thermoplastic polyurethane (TPU) – carbon nanotubes masterbatches

General Information

Thermoplastic Polyurethane (TPU) – Carbon Nanotubes Masterbatch is a conductive masterbatch formulated with TPU resin to deliver excellent electrical conductivity and electrostatic discharge (ESD) properties. This material is ideal for applications requiring flexibility, abrasion resistance, and static control, such as wearable electronics, automotive interiors, and industrial hoses. Its superior elasticity and toughness make it highly processable in extrusion and injection molding, ensuring ease of manufacturing. The masterbatch is designed for uniform dispersion of carbon nanotubes, providing consistent electrical performance while maintaining the inherent flexibility, impact resistance, and chemical resilience of the TPU base polymer.

Key Applications:

- Electrostatic Discharge (ESD) and electrically conductive parts
- Tubes, pipes and hoses extrusion
- Injection molding, extrusion
- Conveyor belts
- Extruded films

Features & Benefits

- Excellent electrical conductivity at low loading
- Retention of key mechanical properties
- Ease of processing
- Better abrasion resistance
- High cleanliness

Available Sizes:

See website for details.

Quality

Compounds were processed using an L/D ratio and a 48 twin-screw extruder under proprietary conditions. Specimens were molded by injection, according to the processing parameters below. In order to get well-dispersed CNT aggregates, ABC3D recommends the use of polymers with a high Melt Flow Index (MFI). Surface Resistivity results can be significantly influenced by molding/extrusion conditions.

Main Characteristics

CARBON NANOTUBES LOADING (%WT)	Real Density (G/L) ISO 1183	MVR (cm^3/10 MIN) NON-STANDARD TEST: 190°C; 15 kg; 4 mm	MELTING POINT (°C) ISO 11357-1,-3
10 ± 1,0	1219	25,6 ± 3	122

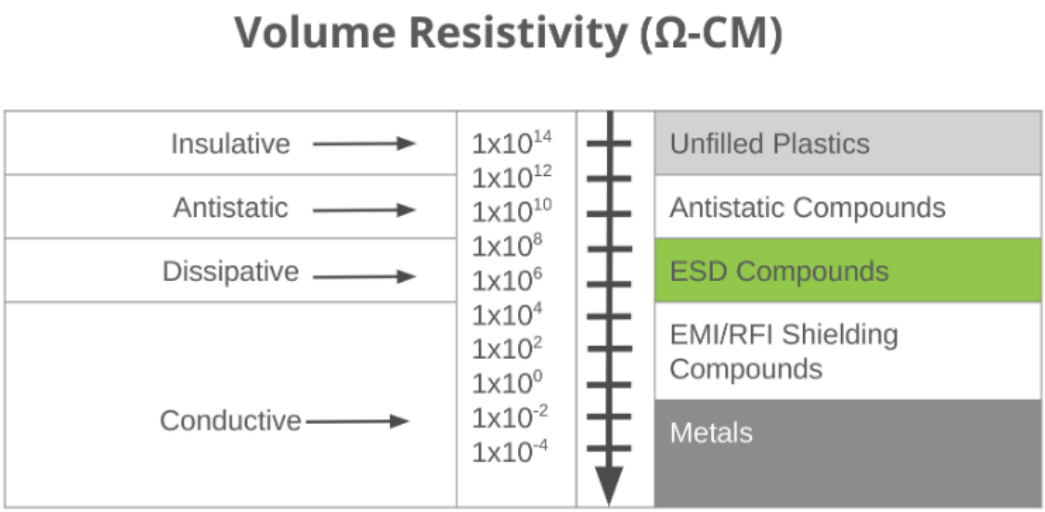
General Processing Guidelines for Injection Molding

Injection Speed	Mold Temp.	Material Temp.	Plasticizing Speed	Back Pressure	Holding Pressure	Holding Time
cm^3/s	°C	°C	m/s	bar	bar	s
1	20	210	0.1	15	750	25

Typical Performance after Injection Molding

Properties	Standard	Unit	Neat TPU	Antistatic TPU	ESD TPU	EMI/RFI Shielding TPU
Young's Modulus	ISO 527-1,2	MPa	29	33,4	50,7	77,9
Tensile strength at break	ISO 527-1,2	MPa	No Break	No Break	No Break	15,3
Strain at break	ISO 527-1,2	%	No Break	No Break	No Break	2,6
Hardness	-	Shore A / Shore D	-	88 / 32	91 / 38	92 / 42
Melt flow -MVR (190°C; 8.7 kg; 2mm)	ISO 1133:1997	cm^3/10 min	-	62	38	8
Color	-	-	White	Black	Black	Black

Volume Resistivity Index



Note: Electrical resistivity measurement in accordance with ABC3D standard method based on standard injection molded IZOD specimens, processed according to parameters provided before (General Processing Guidelines for Injection Molding).

Commercial/Safety Information

Minimum Order Quantity:

Minimum order quantity for ABC-EL-TPU-101 is 20 kg.

Custom Grades:

Besides the commercial grades, ABC3D is able to toll-compound any type of TPU masterbatches to meet its clients' needs.

Health and Safety:

A Material Safety Data Sheets (MSDS) is available to provide both workers and emergency personnel with the proper procedures for handling or working with the ABC-EL-TPU-101. This MSDS includes information such as physical data (form and color, melting point, etc.), handling and storage recommendations, first aid measures and ecological information. The Safety Data Sheet is provided with any order and should be observed.

Disclaimer